APPENDIX H
Fish Supplementation and Rearing Projects

The term "supplementation" is gaining more frequent use. Unfortunately, various definitions have been applied. For the purposes of this project, supplementation is defined as:

> *The use of artificial propagation to maintain or increase wild production while maintaining the long-term fitness of the target population, and keeping ecological and genetic impacts within specific biological limits. Supplementation should not be confused with "enhancement," which is a more general term with wider applications. Enhancement would include release of fish for harvest augmentation as well as stock rebuilding. The majority of hatchery and egg box programs would fall under the category of enhancement.*

The purpose of supplementation is to increase numbers of wild spawners and maintain characteristics, such as the natural genetic profile, contributing to the productivity of the target wild population. Supplementation can be used to: 1) recover populations that are not sustaining themselves and are not likely to recover naturally, 2) reestablish wild stocks that have been lost from areas they historically inhabited, and 3) maintain stocks that face extreme risks.

Candidates for supplementation were limited to: 1) stocks that are well below their desired escapement levels, 2) stocks that cannot rebuild themselves (due to causes other than over-fishing), 3) stocks/species for reestablishment into areas where they historically existed, 4) stocks where the risks of extinction become greater than genetic risks from initiating a supplementation program, or 5) limited cases for research.

Given this, proposed supplementation activities focus on stocks that have or will be listed through the SASSI process as critical/depressed, or endangered/threatened as identified by ESA.

As additional guidance towards a definition, supplementation:

- ❏ Generally involves the use of hatchery facilities; examples where supplementation programs would not utilize hatchery facilities would be reestablishing a stock simply by introducing adult or juvenile fish into barren waters.

- ❏ Uses the most locally adapted brood stock with the intent of mimicking, as close as possible, the genetic, biological, and behavioral characteristics of the native population.

- ❏ Is only an interim measure with a finite life span. A mitigation program, which requires continual hatchery output to maintain stock, is not a supplementation program. An egg box project, which is intended to enhance productivity and ultimately abundance, is not a supplementation program. A project designed to

operate for three generations with the purpose of rebuilding a stock so that it can become self-sustainable is a supplementation program.

❏ Is to be conducted in conjunction with other long-term recovery activities. In most cases, the cause of decline is production oriented and can be attributed to habitat degradation, such as loss of water quality, quantity, barriers to passage, etc. Supplementation cannot be considered the solution to the problem. It is only a treatment to alleviate symptoms while also conducting other measures that address the cause.

❏ Is not intended to be used as a tool to achieve harvest opportunity goals. Supplementation objectives should focus to achieve population (genetic) sustainability.

Because supplementation is largely experimental and specific stock/watershed issues are unique, there is considerable uncertainty about the effectiveness of this type of program. Where possible, it is recommended that supplementation programs begin with pilot projects to test the feasibility and to better assess the risks that are associated with such undertakings. In any case, prior to implementation, supplementation efforts must be rigorously planned to ensure consistency with available guidelines and data. This will include clearly stated objectives, assessment of genetic and ecological risks, and development of appropriate risk management and evaluation plans. All supplementation activities should be reviewed by regional and species managers prior to implementation, and it is recommended that WDFW maintain a leadership role in each supplementation project.

At a minimum, new and proposed supplementation plans and activities must address the following:

1) status of the target wild stock;
2) critical factors for decline of wild stock (e.g., habitat, passage, etc.);
3) goals of the project (desired future conditions, including recovery and habitation restoration plans);
4) natural production objectives and considerations;
5) fishery management objectives and considerations;
6) risk assessments (genetic and ecological risks on targeted and non-targeted species and stocks);
7) availability of suitable donor stock (s);
8) methods, including specific protocols and operations and risk management plans to address such things as brood stock, natural escapement management, incubation, rearing practices and release strategies;
9) monitoring and evaluation objectives and plans; and
10) expected duration.

If a supplementation program involves more than one party, it is recommended that a Memorandum of Understanding or similar agreement be developed and signed by

appropriate representatives. This agreement should include project objectives, time lines, responsibilities, and supporting activities to the operation.

Initiation of any particular program will be dependent on a number of factors, such as brood stock availability, logistical measures, coordination and cooperation with other agencies, organizations and groups, supporting activities that will help ensure success, and funding. Potential programs should be evaluated using items 1-10 listed above.

The Future Brood Document (FBD), which is developed on an annual basis, contains the activities of the current supplementation programs for all hatchery programs implemented throughout the state, including state, cooperative projects, school, and Regional Enhancement Group projects. Other hatchery programs include those designed to provide educational or harvest opportunity.

APPENDIX H Current Salmonid Supplementation Programs by WRIA

WRIA	Region	Species	Stock	SASSI Status (ESA?)	Factors for decline?	Remedial measures?	Rebuilding Plan?
1	Puget Sound	Chinook	Nooksack, North Fork spring	Critical (possibly threatened)	Habitat	Supplementation, harvest measures, habitat considerations	In Progress, Lummi and Nooksack Tribes, WDFW, USFS
4	Puget Sound	Sockeye	Baker River and Lakes	Critical	Passage	Spawning beaches and passage	Yes, Puget Power, WDFW
5	Puget Sound	Chinook	Stillaguamish summers	Depressed	Habitat/Harvest	Tribal program at Harvey Creek	No
8	Puget Sound	Sockeye	Cedar River	Depressed	Passage flows	Harvest constraints and passage	Yes, HCP King Co., WDFW, Muckleshoot Tribe
8	Puget Sound	Steelhead	Cedar River and Lake Washington	Critical	Passage, habitat	Harvest constraints, supplementation	WDFW, Muckleshoot Tribe, Trout Unlimited, Army Corps
10	Puget Sound	Chinook	White River (Puyallup) spring	Critical (possibly)	Passage flows	Coordinated with passage and flow measures	Yes, Muckleshoot, Puyallup, Stillaguamish Tribes, WDFW
15	Puget Sound	Chum	Hood Canal Big Beef Creek	Critical (possibly endangered)	Harvest Habitat?	Harvest and reintroduction measures	Yes, PNPTC, WDFW, USFWS
16	Puget Sound	Chum	Hood Canal Lilliwaup Creek	Critical	Harvest Habitat	Harvest and supplementation measures	Yes, Long Live the Kings, WDFW
17	Puget Sound	Chum	Hood Canal Big Quilcene River	Critical (possibly endangered)	Harvest Habitat?	Harvest and supplementation measures	Yes, PNPTC, WDFW, USFWS
17	Straits of Juan de Fuca	Chum	Salmon Creek	Critical (possibly endangered)	Harvest Habitat		Yes, Wild Olympia salmon/WDFW
18	Straits of Juan de Fuca	Chinook	Dungeness	Critical (possibly threatened)	Habitat		Yes
18	Straits of Juan de Fuca	Pink	Dungeness (lower)	Critical	Habitat - flooding		Yes, WDFW
19	Straits of Juan de Fuca	Sockeye	Ozette River and Lake	Depressed			Yes, Makah Tribe and USFWS

APPENDIX H	Current Salmonid Supplementation Programs by WRIA						
19	Straits of Juan de Fuca	Chinook	Hoko	Depressed	Habitat	Supplementation and harvest measures	
25	Lower Columbia	Chum	Grays River	Depressed	Habitat pass overfishing		No
32	Snake River	Chinook	Tucannon River Springs	Depressed (threatened)	Passage - mainstem dams		
33	Snake River	Chinook	Snake Falls	Depressed (threatened)	Passage - mainstem dams		
35	Snake River	Chinook	Tucannon River Springs	Depressed (threatened)	Passage - mainstem dams		
35	Snake River	Chinook	Snake Falls	Depressed (threatened)	Passage - mainstem dams		
38	Upper Columbia	Chinook	Upper Yakima Springs	Depressed (undetermined)	Passage - mainstem dam flows		
39	Upper Columbia	Chinook	Upper Yakima Springs	Depressed (undetermined)	Passage - mainstem dam flows		
45	Upper Columbia	Chinook	Chiwawa Springs	Depressed (possibly threatened)	Passage - mainstem dams	supplementation, acclimation site	yes
45	Upper Columbia	Chinook	Nason Springs	Depressed	Passage - mainstem dams	No, need to modify current program	No
45	Upper Columbia	Chinook	White (Wenatchee) Springs	Depressed	Passage - mainstem dams	No, need to modify current program	No
46	Upper Columbia	Chinook	Entiat Springs	Depressed	Passage - mainstem dams	No, need to modify current program	No
48	Upper Columbia	Chinook	Twisp Springs	Depressed	Passage - mainstem dams	No, need to modify current program	No
48	Upper Columbia	Chinook	Chewuck Springs	Depressed	Passage - mainstem dams	No, need to modify current program	No

APPENDIX H Recommended Candidate (new) Stocks for Supplementation

WRIA	Region	Species	Stock	SASSI Status (ESA?)	Factors for decline?	Remedial measures?	Rebuilding Plan?
1	Puget Sound	Coho	Nooksack	Unknown	Harvest (?)	No	No
1	Puget Sound	Chinook	S.F. Nooksack	Critical (likely to be proposed as threatened)	Habitat, harvest	Some harvest closures	In planning stage
3	Puget Sound	Chinook	Skagit R. (fall)	Depressed (Likely to be proposed as threatened)	Habitat, harvest	No? Some harvest closures	In planning stage
5	Puget Sound	Coho	Deer Cr.	Unknown	Habitat	No	No
7	Puget Sound	Chinook	Snohomish R. (fall)	Depressed (likely to be proposed as threatened)	Habitat, harvest	No? Some harvest closures	In planning stage
8	Puget Sound	Coho	Lake Wash./ Sammamish Tribs.	Depressed	Habitat, harvest	No	No
8	Puget Sound	Chinook	Cedar R. (fall)	Unknown (likely to be proposed as threatened)	Unknown	Some harvest closures	No
15	Puget Sound	Chum	Union R. (sum.)	Healthy (possibly endangered)	Possible habitat, small size	Control of incidental harvest	In planning stage
16	Puget Sound	Chum	Hood Canal (sum.)	Critical (possibly endangered)	Harvest, habitat, possible hatchery	Harvest control and closures, supplementation stocking	In planning stage
17	Strait of Juan de Fuca	Chum	Discovery Bay (sum.)	Critical (possibly endangered)	Unknown, probably habitat	Harvest closure, habitat restoration, some existing supplementation	In planning stage
17	Puget Sound	Chum	Hood Canal (sum.)	Critical (possibly endangered)	Harvest, habitat, possible hatchery	Harvest control and closures, supplementation stocking	In planning stage
17	Strait of Juan de Fuca	Coho	Discovery Bay	Critical	Habitat	Some, PNPTC draft report	No
18	Strait of Juan de Fuca	Chum	Sequim Bay (sum.)	Depressed (possibly endangered)	Unknown, probably habitat, small size	Harvest closure	In planning stage
18	Strait of Juan de Fuca	Pink	Dungeness R. (fall)	Critical	Habitat	Harvest closure, possible habitat restoration, hatchery coho release control	Formal plan for supplementation, possible habitat restoration planning

APPENDIX H Recommended Candidate (new) Stocks for Supplementation

18	Strait of Juan de Fuca	Pink	Elwha R.	Critical (extinct)	Habitat (including dams)	Supplementation planned	Dam removal and supplementation planned
19	North Coast	Sockeye	Ozette L.	Depressed (possibly threatened)	Habitat	Supplementation	Previous tribal attempt unsuccessful
22	South Coast (Grays Harbor Willapa Bay)	Chinook	Summers:Satsop	Depressed			
24	South Coast (Grays Harbor Willapa Bay)	Chinook	Falls: Fall River (North R. trib. Willapa Bay)	Depressed			
25	Lower Columbia	Coho	All	Depressed	Habitat, harvest	Various?	Various?
25	Lower Columbia	Chum	Grays R.	Depressed (possibly threatened or endangered)	Possible harvest and habitat	Broodstock collection for supplementation	In planning and early implementation stage
25	Lower Columbia	Chum	Hardy Cr.	Healthy (possibly threatened or endangered)	Possible harvest and habitat	Habitat restoration	In planning stage
25	Lower Columbia	Chum	Hamilton Cr.	Depressed (possibly threatened or endangered)	Possible harvest and habitat	None	In planning stage
27	Lower Columbia	Steelhead	Kalama R. (sum.)	Depressed (possibly threatened), other tributaries also help consideration, but start with Kalama	Unknown, probably habitat	Management of hatchery in nat. prod. areas; harvest restrictions Per LCSCI	Supplementation and habitat in planning stage. LCSCI
29	Lower Columbia	Coho	All	Depressed	Habitat, harvest	Various?	Various?
32	Snake	Steelhead	Tucannon R. (sum.)	Depressed (possibly threatened)	Habitat (dams)	Supplementation (unsuccessful)	No - developing under ESA
37	Upper Columbia	Coho	All	Extinct (except Klickitat, which is a composite stock)	Dam passage, inadequate summer flows, harvest, etc.	Unknown	Unknown
37	Upper Columbia	Steelhead	Yakima	Depressed	Passage		

APPENDIX H Recommended Candidate (new) Stocks for Supplementation

37	Upper Columbia	Bull trout/ Dolly Varden	Yakima R.	Critical (proposed threatened)	Habitat (dams), fragmentation, unscreened diversions, low flows	Harvest/season closures spawning area closures, screened diversions, eliminate stocking	No
39	Upper Columbia	Coho	All	Extinct (except Klickitat, which is a composite stock)	Dam passage, inadequate summer flows, harvest, etc.	Unknown	Unknown
39	Upper Columbia	Steelhead	Yakima	Depressed	Passage		
39	Upper Columbia	Bull trout/ Dolly Varden	Yakima R.	Critical (proposed threatened)	Habitat (dams), fragmentation, unscreened diversions, low flows	Harvest/season closures spawning area closures, screened diversions, eliminate stocking	No
45	Upper Columbia	Chinook (spring)	Nason	Depressed (possibly threatened)	Dam passage		Underway
45	Upper Columbia	Chinook (spring)	White (Wenatchee)	Depressed (possibly threatened)	Dam passage		Underway
45	Upper Columbia	Chinook (spring)	Upper Wenatchee	Depressed (possibly threatened)	Dam passage		Underway
45	Upper Columbia	Coho	All	Extinct (except Klickitat, which is a composite stock)	Dam passage, inadequate summer flows, harvest, etc.	Unknown	Unknown
45	Upper Columbia	Steelhead	Wenatchee R. (sum.)	Depressed (possibly endangered)	Habitat (dams)	No	No-developing through HCP process under ESA direction
46	Upper Columbia	Steelhead	Upper Columbia (Entiat, Methow)	Depressed (possibly endangered)	Dam passage		
48	Upper Columbia	Chinook (spring)	Twisp	Depressed (possibly threatened)	Dam passage		Underway
48	Upper Columbia	Chinook (spring)	Chewack	Depressed (possibly threatened)	Dam passage		Underway
48	Upper Columbia	Coho	All	Extinct (except Klickitat, which is a composite stock)	Dam passage, inadequate summer flows, harvest, etc.	Unknown	Unknown
48	Upper Columbia	Steelhead	Upper Columbia (Entiat, Methow)	Depressed (possibly endangered)	Dam passage		

APPENDIX H Recommended Candidate (new) Stocks for Supplementation

39	Upper Columbia	Bull trout/ Dolly Varden	Kachess Lake	Critical (proposed threatened)	Passage, poaching, angling impacts, habitat	Harvest and season closures, spawning area closures, enforcement	No
39	Upper Columbia	Bull trout/ Dolly Varden	Keechelus Lake	Critical (proposed threatened)	Poaching, habitat, low stream flows, timber harvest, agriculture	Harvest and season closures, spawning area closures, enforcement	No
37	Upper Columbia	Bull trout/ Dolly Varden	Ahtanum Creek	Critical (proposed threatened)	Low spawner flows, unscreened diversions, harvest impacts, timber harvest	Harvest season closures, eliminate stocking, screened diversions	No
39	Upper Columbia	Bull trout/ Dolly Varden	NF Teanaway R.	Critical (proposed threatened)	Low spawner flows, unscreened diversions, harvest impacts, timber harvest	Harvest and season closures, spawning area closures, enforcement	No